

CLAIMS

1 1. The method of forming a tool having a relatively large volume
2 base and a relatively small volume work engaging surface supported on the
3 base, comprising: forming a base from wrought or cast materials and creating
4 the working surfaces by depositing superimposed layers of an alloy having the
5 desired hardness and wear-resistant properties on the base by deposition using
6 a programmed numerical control system to position a deposition head
7 comprising a focused heating beam, a material supply for the beam relative to
8 the base so as to create an advancing weld pool which solidifies to form the
9 layers, and feedback means for controlling the process parameters.

1 2. The method of claim 1 where the material supply feeds an alloy
2 powder of materials chosen to provide the working surface with properties of
3 hardness and wear resistance which exceed those of the material of the base.

1 3. The method of claim 1 wherein the tool is a die-cast die
2 requiring a work contacting area having low solubility in the cast material.

1 4. The method of claim 3 where the cast material is aluminum and
2 the deposition material includes molybdenum.

1 5. The method of claim 1 wherein the deposition head is supported
2 on the wrist of a numerically controlled robot programmed to form the work-
3 engaging surface on the base.

1 6. The method of claim 1 wherein the deposition process is closed
2 loop.

1 7. The method of claim 6 wherein the closed-loop operation is
2 achieved by employing optical sensors for the deposited material.